

Notice of Allowability

Application No.

10/614,525

Examiner

Jennifer M. Dolan

Applicant(s)

HAMAGUCHI ET AL.

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amdt/Arguments of 11/24/04.
2. ☒ The allowed claim(s) is/are 12-15.
3. ☒ The drawings filed on 08 July 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/979,188.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

In the first paragraph of the specification (from the Preliminary Amdt. of 7/8/03):

Between "November 20, 2001," and "which", the following has been inserted: --now U.S.

Patent No. 6,633,078—

Response to Arguments

2. Applicant's arguments filed 11/24/04, with respect to claims 12-15 have been fully considered and are persuasive. The 35 U.S.C 103 rejections of claims 12-15 have been withdrawn.

Allowable Subject Matter

3. Claims 12-15 are allowed.
4. The following is an examiner's statement of reasons for allowance:

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The primary reason for allowance is that the claimed method uses a warped semiconductor device substrate mounted concave down on a wiring board and having chips mounted on both sides thereof. The prior art generally teaches that warpage of a wiring board is an undesirable artifact of differences in the coefficient of thermal expansion between the chip and the wiring board. Although several prior art references provide structures utilizing or compensating for wiring board warpage, such as Japanese Patent Publication 2000-031316 to Ishibashi et al., these prior art references do not include a chip or an integrated circuit mounted on the concave-down or recessed portion of the wiring board between the wiring board and the underlying mounting board.

The presence of a second chip between the device wiring board and the mounting board leads to several critical issues, such as potential damages if the chip physically contacts the mounting board; changes in the warpage of the wiring board relative to a single-chip case, and interference between the underlying chip and miscellaneous underlying structures like the mounting jig of Ishibashi or the interposed projecting electrodes. Since these critical issues are present, it is the Examiner's opinion that it would not have been reasonable for a person having ordinary skill in the art to modify the prior art by simply adding an underlying chip to a warped substrate type device (as in Ishibashi), and furthermore, since the present application advantageously uses chips on both sides of the wiring board for the unexpected result of forming a controlled chip-holding recess by altering the relative chip thicknesses, and thus tuning the degree of warpage, it is the Examiner's opinion that the invention as claimed would not have been obvious to a person skilled in the art.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Dolan whose telephone number is (571) 272-1690. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer M. Dolan
Examiner
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